

A Brief Review of Dr. John Ratey's  
SPARK: THE REVOLUTIONARY NEW SCIENCE OF EXERCISE AND THE BRAIN  
By Rich Haglund

“Zero hour” does not sound like something that middle and high school students would choose to add to their class schedule—especially since it involves getting sweaty before first period classes.

In SPARK, Dr. John Ratey explains how dramatic breakthroughs in brain research during the last 20 years have illustrated the connection between exercise and improved mental fitness. Not only does running build muscles, it literally builds and rebuilds parts of the brain.

Ratey begins the book by describing the work of Phil Lawler, a junior high physical education teacher in Naperville, Illinois. Lawler found a heart rate monitor in a basket of P.E. equipment at the beginning of the year. He decided to make good use of it. As he measured the heart rates of different students running the mile, he was astounded. He was about to tell one sixth grade girl—“who was thin but not the least bit athletic”—to pick up the pace. But he noticed that her average heart rate was 187. When she crossed the finish line it was 207. Her maximum, Lawler noted, would have been about 209. So, she was working much harder than Lawler thought.<sup>1</sup>

Lawler began grading students not “on such trivia as the dimensions of a regulation volleyball court,” but based on “how much time they spend in their target heart rate zones during any given activity.”<sup>2</sup> The school also changed the activities available in PE so they were more focused on fitness. Waiting a turn to play basketball or participate in many other sports did not translate to students actually increasing their fitness levels. So, students could choose from things like running, climbing, exercise bikes, or playing Dance Dance Revolution.<sup>3</sup> Sports physiologist Craig Broeder, who conducted a fitness study in Naperville, said, “You have to find something that allows a student to feel comfortable at excelling. So that it feels like them when they're doing it. When you only give a kid a limited option, like playing basketball, and you make it seem like punishment or boot camp, there's no way he's going to continue doing it.” Ratey highlights the increased academic achievement that followed.

Participation in Zero Hour physical activity before school started led to significant academic achievement. On the Trends in International Mathematics and Science Study (TIMSS), Naperville students finished first in the world in science and sixth in math, behind Singapore, Korea, Taiwan, Hong Kong and Japan.<sup>4</sup> Because Naperville is a “demographically advantaged school district,” Ratey looked at poorer communities where Naperville-style PE programs were applied. In Titusville, Pennsylvania, similar results occurred. Since implementing the program, scores in Titusville went from below the state average to 17 percent above the state average in reading, and to 18 percent above in math.<sup>5</sup>

Ratey tells the story of two students going kayaking on the morning they took the ACT. “They were so confident in their preparation, and so attuned to how exercise helped them focus, that they were comfortable splashing around a cold pool right before an important exam. How

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<sup>1</sup> John J. Ratey, SPARK: THE REVOLUTIONARY NEW SCIENCE OF EXERCISE AND THE BRAIN 17 (2008).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.* at 20.

<sup>4</sup> *Id.* at 14.

<sup>5</sup> *Id.* at 32. And there has not been a single fist fight among the 550 junior high students there since 2000.

many high school kids do you know who would do that? How many adults do you know who would do that?”<sup>6</sup> These students had learned how to manage their brains with exercise.

Prime time television commercials often suggest to teenagers that alcohol will facilitate more successful social interaction. The physical education teachers in one school Ratey examined prove that physical activity, rather than drinking, helps hardwire social skills. Ratey describes how the ninth graders at one school developed their social skills while square dancing:

Their brains are primed by the movement, and they lay down circuits that record the experience, which at first may be painful but which becomes less so in the context of an experience shared by the entire class. It's an intuitively brilliant way to bring kids out of their shells, at a poignant age when everyone feels self-conscious. Zientarski puts them all in the same boat and gives them the tools and encouragement to build up their self confidence. The dancing makes the whole lesson work.<sup>7</sup>

The idea of physical activity being a central part of education has been around for thousands of years. For example, Plato recorded Socrates' insistence on physical education in *THE REPUBLIC*. But, research in the 1990s first demonstrated the tight connection between movement and cognitive development.<sup>8</sup> One researcher, Dr. Carl Cotman “nailed down a direct biological connection between movement and cognitive function . . . by showing that exercise sparks the master molecule of the learning process.”<sup>9</sup> Our brains are not hard wired. Instead, Ratey says, they are “constantly rewired.” We have the capacity, he explained, to be our own electrician.<sup>10</sup>

“Exercise,” Ratey concludes, “is the single most powerful tool you have to optimize your brain function.”<sup>11</sup> You (or your teacher or your school) can set up your environment to “encourage focus and accomplishment,” and “corral your attention through your own actions and become more productive.”<sup>12</sup> “Being in motion,” Ratey says, “fosters the feeling that you can accomplish something.”<sup>13</sup>

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<sup>6</sup> *Id.* at 28.

<sup>7</sup> *Id.* at 29-30.

<sup>8</sup> *Id.* at 43.

<sup>9</sup> *Id.*

<sup>10</sup> *Id.* at 36.

<sup>11</sup> *Id.* at 245.

<sup>12</sup> *Id.* at 164.

<sup>13</sup> *Id.* at 175.